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ABSTRACT

This report analyzes data from the parent and student components of the National Educational Longitudinal Study of 1988 to investigate family educational involvement in secondary education. It examines whether parental involvement influences the educational achievements of high school seniors. By utilizing multiple involvement indicators for the 8th and 12th grades, the study confirms the importance of considering the multidimensional nature of parental involvement in students' education. The effects of parental involvement on 12th grade achievement depend on the type of family practices considered. General conclusions based on these findings support the existence of positive effects of parental involvement on 12th grade academic achievements. The effects are stronger for course credits and curricular placement than for test scores. High levels of educational expectations, consistent encouragement, and actions that enhance learning opportunities of students are the major ways by which families positively influence the educational achievements of their teens. Regardless of socioeconomic or race/ethnic background, families with high levels of educational expectations have the most positive effects on senior achievements. These effects are present when parental expectations are measured in the middle grades or in high school. Three appendixes present a table of base year parental involvement, factor analysis results on parental involvement, and descriptive statistics about study variables. (Contains 9 tables and 19 references.) (Author/SLD)

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ED 426 174

CRESPAR

EXPANDING THE KNOWLEDGE OF PARENTAL INVOLVEMENT IN SECONDARY EDUCATION

Effects on High School Academic Success

Sophia Catsambis

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CENTER FOR RESEARCH ON THE EDUCATION OF STUDENTS PLACED AT RISK

Johns Hopkins University & Howard University

EXPANDING KNOWLEDGE OF PARENTAL INVOLVEMENT IN SECONDARY EDUCATION

Effects on High School Academic Success

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Queens College, CUNY

Report No. 27

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Every child has the capacity to succeed in school and in life. Yet far too many children, especially those from poor and minority families, are placed at risk by school practices that are based on a sorting paradigm in which some students receive high-expectations instruction while the rest are relegated to lower quality education and lower quality futures. The sorting perspective must be replaced by a "talent development" model that asserts that all children are capable of succeeding in a rich and demanding curriculum with appropriate assistance and support.

The mission of the Center for Research on the Education of Students Placed At Risk (CRESPAR) is to conduct the research, development, evaluation, and dissemination needed to transform schooling for students placed at risk. The work of the Center is guided by three central themes — ensuring the success of all students at key development points, building on students' personal and cultural assets, and scaling up effective programs — and conducted through seven research and development programs and a program of institutional activities.

CRESPAR is organized as a partnership of Johns Hopkins University and Howard University, in collaboration with researchers at the University of California at Santa Barbara, University of California at Los Angeles, University of Chicago, Manpower Demonstration Research Corporation, University of Memphis, Haskell Indian Nations University, and University of Houston-Clear Lake.

CRESPAR is supported by the National Institute on the Education of At-Risk Students (At-Risk Institute), one of five institutes created by the Educational Research, Development, Dissemination and Improvement Act of 1994 and located within the Office of Educational Research and Improvement (OERI) at the U.S. Department of Education. The At-Risk Institute supports a range of research and development activities designed to improve the education of students at risk of educational failure because of limited English proficiency, poverty, race, geographic location, or economic disadvantage.

Abstract

This report analyzes data from the parent and student components of the *National Educational Longitudinal Study of 1988* to investigate family educational involvement in secondary education. It examines whether parental involvement influences the educational achievements of high school seniors. By utilizing multiple involvement indicators for the eighth and twelfth grades, the study confirms the importance of considering the multidimensional nature of parental involvement in students' education. The effects of parental involvement on twelfth grade achievement depend on the type of family practices considered.

General conclusions based on the present findings support the existence of positive effects of parental involvement on twelfth grade academic achievements. The effects are stronger for course credits and curricular placement than for test scores. High levels of educational expectations, consistent encouragement, and actions that enhance learning opportunities of students are the major ways by which families positively influence the educational achievements of their teens. Regardless of socioeconomic or race/ethnic background, families with high levels of educational expectations have the most positive effects on senior achievements. These effects are present when parental expectations are measured in the middle grades or in high school.

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Introduction

The role of parental involvement in children's education has become a central issue in educational policy and research. Fueled by concerns of how to improve student achievement and reduce educational inequities, parental involvement and family-school partnerships are considered among the most successful educational strategies. Research findings support the existence of a positive relationship between parental involvement and educational success, especially in the elementary school years. However, current knowledge regarding the nature and magnitude of the effects of parental involvement in secondary education is inconsistent and limited in scope (Singh, Bickley, et al., 1995). Most of the existing research has investigated parental involvement in the primary and middle grades. Less is known about successful parental involvement in high school. The current project seeks to expand knowledge of the different parental practices in secondary education, as well as their effects on the academic success of high school seniors. It uses data from the *National Educational Longitudinal Study* of 1988 and its follow-up surveys to build on previous research which sought to identify the types of involvement that parents are engaged in during the eighth and twelfth grades (Catsambis & Garland, 1996).

Research Background

Conceptualizing Parental Involvement

Despite the significant amount of research that investigates parental involvement and its effects on student achievement, the field has not produced clear and consistent results for secondary education. Differences in how researchers conceptualize parental involvement is one of the major reasons for inconsistent results. Some researchers conceive of parental involvement as participation in school activities; others, as parental aspirations for their children; and others, as involvement in children's learning activities at home. Only recently have researchers recognized the multi-dimensional character of parental involvement and have tried to capture the multitude of parental activities regarding children's education. This study conceptualizes parental involvement from a perspective that considers family, school, and community as overlapping spheres of influence (Epstein 1987, 1990, 1992). These spheres enter into complex interrelationships which define six different types of parental involvement: (1) parents' basic obligations for establishing a positive learning environment at home, (2) parent-school communications about school programs and student progress, (3) parent participation and volunteering at school, (4) parent and school communications

regarding learning activities at home, (5) parent involvement in school decision making and governance, and (6) parent collaboration with community organizations that increase students' learning opportunities (Epstein, 1992).

The significance of the theoretical perspective of overlapping spheres of influence lies not only in the identification of different types of parental involvement, but also in the recognition that parents' involvement in children's education and family-school connections are not static. Rather, differences in any of the three overlapping spheres of influence can influence which types of involvement parents are engaged in. Parental involvement may, therefore, vary by factors such as students' grade level, socioeconomic and race/ethnic background, family relationships and experiences, and school policies (Epstein, 1992).

This perspective points to the importance of expanding existing knowledge of how family involvement can affect student progress at different levels of education and of how educational institutions can promote family practices that increase students' further educational opportunities. The above framework was developed in investigations of parental involvement at the elementary and middle school levels. Research that uses this general conceptualization and the specific typology to examine parental influences during high school is limited (Lee, 1994).

Parental Involvement and Its Effects on Student Outcomes

Research findings show that parental involvement in children's learning activities positively influences their levels of achievement and motivation to learn (Epstein, 1992). Many studies indicate that the influences of parental involvement upon students' primary education make a difference. Similarly, parental influence on a student's academic success in high school may be a factor that cannot be ignored. The present study builds upon existing research that has identified different types of parental involvement in the middle grades.

Data from the public use files of the *National Educational Longitudinal Study* of 1988 (NELS:88) are enhancing the study of parental involvement in secondary education. Research using these data reveals that in the middle grades, parents are mostly involved in the daily supervision of children's lives (Type 1, above) and educational activities (Type 4, above). These activities include establishing family rules for the supervision of students' homework, TV viewing, and curfews, and discussing career aspirations and plans about high school programs. Most parents are trying to supervise and guide their children during the

middle grades, but with limited assistance from schools. They are more likely to supervise and set rules about activities that families traditionally control (such as doing family chores), than about activities for which they lack information (such as improving report card grades). Parents report a serious lack of communication from schools, and the families themselves contact the schools infrequently. It seems that few middle schools have comprehensive programs for parental involvement and few parents volunteer at school (Epstein & Lee, 1995). Some schools, though, foster higher levels of communications with parents than other schools (Sui-Chu & Willms, 1996; Epstein, 1990).

In high school, parental involvement of Epstein's Type 1 drops as parents loosen their daily supervision of their teenagers, but parents become more concerned about the learning opportunities that high schools provide. Parental involvement during high school increases for Types 2 and 3 — parent-school communications about school programs and student progress and parent participation as volunteers at school (Catsambis & Garland, 1997). As children move from the middle grades to the last years of high school, parents also crystallize their educational expectations for their children. As students near high school graduation, parents become increasingly concerned about their teen's further education and about the effects of high school programs on postsecondary opportunities (Catsambis & Garland, 1997).

Investigations show that the effects of family practices on students' academic success tend to vary by age and are strongest for elementary school children (Singh et al., 1995). Some researchers report no effects of parental involvement on student standardized test scores in high school (Lee, 1994; Keith, 1991, cited in Singh et al., 1995). However, other researchers conclude that parental involvement remains important for children's success throughout secondary education (Astone & McLanahan, 1991; Fehrmann et al., 1987; Keith et al., 1993; Lee, 1994; Muller, 1993; Singh, Bickley, et al., 1995; Stevenson & Baker, 1987; Sui-Chu & Willms, 1996).

By far the most important effect that is consistent across studies is that of parents' educational aspirations for their children. High parental aspirations tend to positively influence students' levels of achievement in primary and secondary education (Astone & McLanahan, 1991; Keith et al., 1993; Singh, Bickley, et al., 1995; Milne et al., 1986).

A number of studies report that the academic achievement of secondary school students is also positively affected by other indicators of parental involvement, including parent/student discussions regarding school experiences and academic matters (Keith et al.,

1993; Lee, 1994; Sui-Chu & Willms, 1996; Muller, 1993), general parental supervision and monitoring of student progress (Astone & McLanahan, 1991; Fehrmann et al., 1987; Sui-Chu & Willms, 1996), and to a lesser extent, parent participation in school-related activities (volunteering and parent-teacher organizations) (Sui-Chu & Willms, 1996; Stevenson & Baker, 1987) and participation in parent-teacher conferences (Stevenson & Baker, 1987).

Most of the above studies examine the effects of parental involvement in middle school rather than in high school. Moreover, different studies produce inconsistent results regarding the effects of specific family practices. For example, Singh et al., (1995) analyze the same NELS:88 data as Keith et al., (1993), Ho and Wilms (1996), and Muller (1993) but, unlike them, find that eighth grade achievement is not affected by parent-student communication and parental participation in school-related activities.

Some negative effects of parental involvement on students' achievement are also reported for a number of parental involvement indicators: parents' close supervision of homework and after school activities (Milne et al., 1986; Muller, 1993), frequent contacts with school or parent-teacher conferences (Ho & Wilms, 1996; Lee, 1994; Muller, 1993), and frequent talks with children (Astone & McLanahan, 1991). Thus, both positive and negative effects are reported by different researchers for parent communications with the student or school, and for parental monitoring of students' behavior. In cases where negative effects are reported, researchers interpret them as indicating parents' efforts to help children with low academic performance or behavioral problems. In the study by Sui-Chu and Willms (1996), some of the negative effect of frequent communication with schools on eighth grade achievement is mediated by students' problematic behavior and performance. The authors recognize the need to include more detailed measures of behavioral and learning difficulties in order to fully account for this negative effect.

Almost all studies on parental involvement in middle school and high school are concerned with effects on achievement test scores, but Lee (1994) utilizes NELS:88 data to examine the effects of family involvement on a variety of educational outcomes in addition to achievement test scores. This study reveals that the effects of parental involvement in high school may be stronger on students' behavior, attitudes toward school, and report card grades than on achievement test scores. The study reports a number of noteworthy effects of different types of family involvement on tenth graders' attitudes and behaviors, after controlling for students' socioeconomic background, family structure, and previous educational characteristics. The types of involvement that have consistent and sizable effects on a number of outcomes for tenth graders are frequent family discussions about educational

matters, family involvement with homework, and to a somewhat lesser extent, parental participation in school activities (such as parent audiences, attending school meetings, and volunteering). These types of involvement positively affect a variety of educational outcomes, such as students' reading habits and homework, attitudes towards school and teachers, and commitment to school work. They also tend to reduce the frequency of behavioral problems and absenteeism (Lee, 1994). However, the study by Lee relies on students' reports of their parents' behaviors and practices. Analyses of data from parents are needed to validate the above findings and increase our knowledge of the effects of parental involvement through the twelfth grade.

As the above discussion suggests, existing knowledge of parental involvement in secondary education is limited in scope. Considerable gaps in the literature exist about the effects of parental involvement on educational outcomes other than test scores, and on long-term effects of different family practices. Moreover, the research findings on the effects of parental involvement on achievement test scores tend to be inconsistent. This may be due to age differences of the children under investigation, differences in analytical research strategies, and differences in the sources of information and variables used as indicators of parental involvement. It is possible that certain types of parental involvement are more important in middle grades than in high school, and vice versa.

Inconsistencies in reported results also may be due to differences in research strategies to investigate the effects of various indicators of parental involvement. For example, Keith et al. (1993) report positive effects of parent-child communications on eighth grade achievement by applying a structural equations model where parental aspirations and parent-child communications are considered as indicators of the same latent construct of parental involvement. In a second study, which reports no effects of parent-child communications, the same team of researchers use an identical analytical strategy and the same data, but treat parental aspirations and parent-child communications as separate constructs (Singh et al., 1995).

Inconsistencies in results also may be due to the diverse sources of information and variables used by researchers. A number of studies rely on student rather than parent reports of their own behaviors. This is particularly the case for the studies of parental involvement at the high school level. Thus, studies at this school level report the effects of student reports, experiences, and perceptions, rather than the effects of actual parental behaviors. Studies also use variables that indicate entirely different types of parental activities. Analyses of data from NELS:88 show that indicators of parental involvement cannot be used interchangeably.

At least some types of involvement are not correlated with each other, and therefore should not be considered as indicators of one overall construct of parental involvement. Few studies have considered an all-encompassing framework that can adequately capture the multitude of parenting activities geared towards children's education.

The Present Study: Aims and Research Questions

The present study seeks to further knowledge of parental involvement and its possible long-term and short-term effects on students' achievement. It seeks to address inconsistencies in the existing literature by (a) analyzing data from a national longitudinal study which surveyed both students and their parents, (b) focusing on a specific age group of students which is relatively ignored in the relevant literature, (c) employing a consistent analytical strategy to estimate the effects of parental involvement on student achievement, and (d) utilizing several indicators that capture the multi-dimensional aspect of parents' activities regarding the education of their children. This investigation builds on previous works by Lee (1994) and Catsambis and Garland (1997) which employ indicators of the six types of family practices identified by Epstein. Data from the NELS:88 parent and student surveys collected during students' eighth and twelfth grades are used to examine the following research questions:

1. Does parental involvement during high school affect the educational outcomes of high school seniors?

    1a. What types of parental involvement during high school have the strongest effects on the educational outcomes of high school seniors?

    1b. Which twelfth grade outcomes are most affected by parental involvement during high school?

2. Does parental involvement during the eighth grade have long-term effects on twelfth grade student outcomes?

    2a. What types of parental involvement in the eighth grade have lasting effects on the educational outcomes of high school seniors?

    2b. Which twelfth grade outcomes are most affected by parental involvement measured earlier in the eighth grade?

Data and Methods of Analysis

The data used in this study are derived from a major longitudinal panel study sponsored by the National Center of Education Statistics. The *National Educational Longitudinal Study* (NELS:88) was conducted to explore student progress from the eighth grade through high school, college, and the work force.

The Base-Year NELS:88 survey is based on a representative sample of the nations' eighth graders in 1988 and consists of student, parent, teacher, and school administrator surveys. The First Follow-up Survey conducted two years later (in 1990) included students, teachers, and school administrators, but parents were not surveyed. In the Second Follow-up, conducted two years later (in 1992), all four groups were re-interviewed. This report analyzes data from the Base-Year and the Second Follow-up Surveys of parents and students. The sample consists of more than 15,000 parents who were followed from 1988 to 1992. The large size of the sample and its longitudinal design make NELS:88 a rich and important data set that can be used to address many questions about national patterns of parental involvement and its effects from the middle grades to high school and beyond.

Analyses for this study use data from the subsample of 13,580 parents whose children remained in school through the twelfth grade. Parents whose children dropped out of school are not included in this study.[1]

Variables

Independent Variables

Parental Involvement. Each NELS parent questionnaire includes a great number of questions that can be considered as indicators of parental involvement, many of which are unique to the eighth and twelfth grades. This study uses parental involvement indices that were constructed by Catsambis and Garland (1997). For the purpose of index construction, factor analyses were conducted separately for the Base Year and Second Follow-Up Survey data. The analyses yield a total of twelve involvement indices for the eighth grade and fifteen

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[1] All data presented here are based on this sample, weighted by the appropriate sampling weight (F2PNLWT). To allow for tests of statistical significance, the weight has been standardized (F2PNLWT/mean F2PNLWT).

indices for the twelfth grade.[2] These indices represent the six types of parental involvement identified by Epstein (1992, 1995). Appendices A and B provide more detailed information on the factor analyses.

The eighth grade indices of parental involvement include:

Type 1 — Parent Obligations:	Three indices are considered as indicators of this type of involvement: parents' educational expectations for their child, parental control of the child's TV viewing, and parental supervision of academic/behavioral activities (doing homework, doing household chores, and maintaining a certain grade average).
Type 2 — Parent/School Communicating:	This type of parent involvement is represented by two indices: communication regarding the student's behavior and academic performance, and communication regarding the school's academic program and student placements.
Type 3 — Support of School:	One index regarding parents' school volunteering and fund raising.
Type 4 — Learning Activities at Home:	Two indices of parents' efforts to enhance their child's learning opportunities through private lessons, and one index of how often parents talk to the eighth grader about school related experiences and plans.
Type 5 — Decision Making:	One index concerns the degree to which parents participate in parent-teacher organizations.
Type 6 — Collaborating with Community:	Two indices of parents' encouragement of their children's participation in community organizations and activities: student visits to museums and participation in scouting and sports.

The twelfth grade indices of parental involvement include:

Type 1 — Parent Obligations:	Six indices of parenting styles include: two representing communications with students concerning general issues in the teen's life, and time spent in various activities with the teen; three indices representing parental decisions about the teen's entertainment, school effort (knowledge of teen's course work), and further education, and a final index referring to parents' private education expenses.

[2] All involvement indices are standardized to a mean of 0.0 and a standard deviation of 1.0.

Type 2 — Parent/School Communicating:	Three indices distinguish parent-initiated contacts regarding the teen's academic opportunities and post-high school plans, school-initiated contacts regarding academic performance and preparation for college, and parent/school communications regarding the teen's behavior at school. A fourth index relates to the parent's problems in communicating with school personnel.
Type 3 — Support of School:	One index concerns parent's volunteering at school and attending other social or sports activities at school.
Type 4 — Learning Activities at Home:	Two indices of the parents' interest in the teen's post-secondary education (learning about postsecondary opportunities and college encouragement). A third index refers to parental encouragement to complete secondary education.
Type 5 — Decision Making:	Variables for this type of involvement were not included in the twelfth grade parent questionnaire.
Type 6 — Collaborating with Community:	One index of the degree to which parents communicate with each other about their children's learning opportunities at school and about future plans.

Social Background. The indicators of social background include a socioeconomic status composite of parents' education, occupation, and income, and a selection of family possessions, constructed by NCES (Ingels et al., 1989); and race/ethnicity.

Family Characteristics. Separate variables were created for the eighth and twelfth grades. For each grade, they include family size, living in a two-parent home, and two indicators of parental work status. For students in two-parent homes a variable was constructed to indicate whether both parents work or not (two-income family). For students in single-parent homes, an indicator of whether the parent is employed or not.

Student Characteristics. Two identical sets of variables for the eighth and twelfth grades were created from the student surveys: English as a native language or not; a composite of lack of school engagement indicating whether the student comes to school without pencils and books and without homework; a composite of absenteeism indicating frequency of skipping school, cutting classes, and coming late to school.

Achievement. Analyses of the effects of parental involvement on twelfth-grade educational outcomes include indicators of eighth-grade achievement as controls. For each twelfth-grade educational outcome, an indicator of prior achievement on the same outcome is introduced as a control. These control variables are derived from a battery of achievement

tests developed by ETS and administered to all students in the eighth-grade sample.[3] The variables used for this report include an overall eighth-grade achievement test composite and standardized achievement scores in mathematics, reading, and science.

Dependent Variables

A series of twelfth grade educational outcomes are used as dependent variables: standardized test scores in mathematics, science, and reading; total high school credits completed in English, mathematics and science; and enrollment in an academic high school curriculum. The test scores are part of the test battery which was developed by ETS and was administered to all students attending school. High school credits completed are derived from student transcript data and are available in the public use data file. Type of high school curriculum is self reported by students. Descriptive statistics on the dependent variables are presented in Appendix C.

Method of Analysis

Data analysis is conducted in two separate sections. The first section investigates the effects of twelfth grade parental involvement on twelfth grade student outcomes.[4] The second section investigates the effects of eighth grade parental involvement on twelfth grade student outcomes. In each section, multiple regression (OLS) analyses are conducted. The dependent variables are regressed on the indices of parental involvement of either the eighth or the twelfth grade.[5] Independent control variables are then introduced in a second set of regression analyses. The coefficients of parental involvement are then compared with and without controls.

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[3] For further details on the achievement battery tests see Ingels et al., 1989.

[4] Eighth and twelfth grade involvement indices are not included in the same regressions because previous analyses have shown that the two sets of indices are only minimally correlated (Catsambis & Garland, 1996). This is primarily due to the variables available for index construction. Since the base year and second follow-up parent data do not include identical items, comparable indices across grades could not be constructed.

[5] Because indices were created on the basis of factor analyses with varimax rotation, indices within each grade are not correlated with each other. Thus, the coefficients of the involvement indices are not affected by multicolinearity when introduced as a group in multiple regressions.

Research Findings

Effects of Twelfth Grade Parental Involvement on Senior Achievement

The effects of twelfth grade parental involvement are investigated for different types of achievement outcomes. First, parental involvement effects on seniors' test scores in mathematics, science, and reading are investigated. Then, parental involvement effects are investigated on the number of credits that students completed in high school in mathematics, science, and English, and on students' curricular enrollment.

Effects of Twelfth Grade Parental Involvement on Test Scores

The effects of different types of high school parental involvement on achievement test scores are presented in Table 1a. Regression analyses are conducted in two steps. First, students' twelfth-grade test scores are regressed on the fifteen twelfth-grade parental involvement indicators. Second, independent variables are introduced as controls (i.e., socioeconomic status, race/ethnicity, family size, two-parent home, parent work status, English as a second language, and eighth-grade achievement in either mathematics, science, or reading).

Indicators of Type 1 involvement — parenting (family child-raising practices) — tend to have weak effects on students' test scores once student background and earlier achievement are controlled (Table 1a). Parent/teen communication, parent/teen activities, and behavioral supervision show negative effects on mathematics and science test scores. These initial associations of parent/teen communication and activities are greatly reduced with the introduction of controls. Parental knowledge of teen's coursework and academic supervision have very small positive effects on twelfth grade test scores.

Types of involvement that refer to parental communication with school (Type 2) have weak effects on test scores as well, with one notable exception (Table 1a). Educational contacts with school have a moderate negative effect on all three test scores. The negative coefficients of this variable are reduced to one-half of their values with the introduction of controls; they diminish further when student behavioral characteristics are controlled for (findings not presented here). This pattern suggests that parents whose children have academic or behavioral problems tend to seek the help of school personnel and increase their contacts with school.

Table 1a: Influences of Twelfth Grade Parental Involvement on Twelfth Grade Test Scores (Standardized OLS Coefficients)

Parental Involvement	Achievement Test Scores					
	Mathematics		Science		Reading	
	No Controls	Controls [a]	No Controls	Controls [b]	No Controls	Controls [c]
TYPE I: PARENT OBLIGATIONS						
Parent/Teen Communication	**-.07**	**-.04**	-.02+	-.02	.00+	-.01+
Parent/Teen Activities	**-.07**	**-.02**	**-.08**	**-.04**	-.02+	-.01+
Behavioral Supervision	-.10	.02	-.11	.03	.08	.01+
Knows Course Work	.08	.03	.05	.00+	.05	.00+
Academic Supervision	.03	.02	.04	.03	.04	.04
TYPE II: PARENT/SCHOOL COMMUNICATION						
School Initiated Academic Contacts	.03	.02	.03	.03	.01+	.00+
Educational Contacts with School	**-.14**	**-.07**	**-.08**	**-.03**	**-.10**	**-.04**
Post Secondary Contacts with School	.00+	.00+	-.01+	-.02	.00+	.00+
Problems Communicating with School	-.03	.03	-.05	.03	-.05	.01+
TYPE III: SUPPORT OF SCHOOL						
Support of School	**.12**	**.04**	**.09**	**.02**	.03	-.01
TYPE IV: LEARNING ACTIVITIES						
College Encouragement	**.30**	**.11**	**.23**	**.09**	**.26**	**.09**
High School Graduation Encouragement	**-.29**	**-.06**	**-.25**	**-.06**	**-.23**	**-.04**
Learn Post Secondary Opportunities	.10	.03	.07	.02	.08	.01+
Private Educational Expenses	.04 +	.00+	.02+	.00+	.03	-.02
TYPE VI: COMMUNITY ACCESS						
Parent to Parent Communication	.00+	-.01	.00+	-.01+	.00+	-.01
R^2	.25	.72	.16	.54	.15	.56

Note: The following twelfth grade variables are included in all multivariate analyses with controls: Black, Asian, Latino, SES, Family Size, Two Parent Home, Parent's Work status in two- and one-parent home, English as a second language and a control for prior Achievement (see below).

a - Eighth grade standardized mathematics score is introduced as a prior achievement indicator together with the above controls.
b - Eighth grade standardized science score is introduced as a prior achievement indicator together with the above controls.
c - Eighth grade standardized reading score is introduced as a prior achievement indicator together with the above controls.
+ Coefficients **not** significant at alpha.<= 05. All others, significant at alpha <= 01

Participating in activities that support the high school (Type 3 involvement) has a positive association with mathematics and science test scores. The coefficients of this variable substantially diminish with the introduction of controls. Thus, the positive effects of parents' volunteering and participating in school activities are mostly explained by socioeconomic and other background characteristics of families and prior achievement levels. Support of the school has only small direct effects on achievement, mainly on mathematics scores.

Indicators of Type 4 involvement — enhancing learning opportunities at home — have the strongest effects on test scores. By far, parental encouragement for college has the strongest positive effects on all three achievement test scores. This variable is a composite of five indicators of educational expectations, parent/teen discussions about college, and discussions about preparing for the SAT/ACT exams. The effect of parental encouragement for college is slightly stronger on mathematics test scores. By contrast, encouragement for high school graduation has significant negative associations with achievement test scores, but these associations greatly decrease with controls on student background and prior achievement. This suggests that parents who are encouraging high school graduation are interacting with students who are less successful academically and who may be at risk of dropping out.

The single indicator of parental involvement, Type 6 — collaborating with others in the community — has no noteworthy associations with achievement test scores. Parents' contacts with other parents do not influence the test performance of twelfth grade students.

Comparing coefficients of each involvement indicator across the three achievement test scores reveals a fairly clear pattern across most types of involvement. The effects of parental involvement indicators are weakest for test scores in reading and strongest for test scores in mathematics. This is especially clear for most indicators of parenting (Type1), for educational contacts with school (Type 2), and for college encouragement (Type 4).

Effects of Twelfth Grade Parental Involvement on Coursework and Curricular Enrollment

Twelfth grade parental involvement tends to be more strongly linked to high school credits than to achievement test scores (Table 1b). Indicators of Type 1 involvement, frequency of parent/teen communication and common parent/teen activities, have negative associations with course credits. The effects remain when controls are introduced. In additional regression analyses which are not presented here, the effects were slightly reduced

by introducing additional controls on students' absence and school engagement. Similar findings were reported in a previous study by Astone and McLanahan (1991).

The most notable effect of Type 1 indicators is that of parent's knowledge of teen's coursework. This variable has positive direct and indirect effects on mathematics, science, and English credits. This suggests that parents of all social backgrounds and family configurations who closely monitor their teens' coursework have a positive influence on the number of credits completed. The pattern is clear for all three subjects, but is strongest for credits in English.

Among the indicators of Type 2 involvement (parent/school communications), educational contacts with school has a strong negative effect on course credits completed. The effect of this variable is stronger on course credits in mathematics and science than in English. None of the independent control variables used in these multivariate analyses explains or mediates these effects. Two variables that control for student engagement in school and school attendance were introduced in a subsequent regression step that is not presented here. Their introduction slightly reduced the magnitude of these coefficients. It is possible that additional indicators of problematic behavior, not included in the analyses, may explain these negative results.

The single indicator of Type 3 involvement — parents' support of school — shows positive and direct effects on course credits completed. The strength of this effect is similar for all three subjects. Parents who continue to support the high school may be more knowledgeable about the school's curriculum or the importance of high school coursework for further success in education. These parents may be able to positively influence the number of credits that teens complete in core high school subjects.

Indicators of parents' efforts to enhance student learning opportunities (Type 4 involvement) have important effects on course credits completed. As noted for the effects on achievement test scores, parental encouragement for college attendance is the most important variable. Students whose parents take an active role in their preparation for postsecondary education tend to complete more credits in English, mathematics, and science than do other students with similar background and prior achievement. Also, parents' efforts to acquire information about postsecondary opportunities have positive effects on teens' course completions. The influence of these two involvement indicators is somewhat stronger for mathematics and science than for English credits.

Table 1b: Influences of Twelfth Grade Parental Involvement on High School Credits Completed by the Twelfth Grade (Standardized OLS Coefficients)

Parental Involvement	Math		Science		English	
	No Controls	Controls [a]	No Controls	Controls [b]	No Controls	Controls [c]
TYPE I: PARENT OBLIGATIONS						
Parent/Teen Communication	**-.06**	**-.06**	**-.06**	**-.05**	**-.05**	**-.06**
Parent/Teen Activities	**-.04**	**-.02**	**-.05**	**-.04**	-.01+	-.02+
Behavioral Supervision	.03	.02+	.04	.01+	.04	.03
Knows Course Work	**.06**	**.04**	**.06**	**.04**	**.10**	**.08**
Academic Supervision	-.02	-.01+	-.03	-.02	-.02	-.01+
TYPE II: PARENT/SCHOOL COMMUNICATION						
School Initiated Academic Contacts	.02+	.01+	.00+	.00+	.00+	.00+
Educational Contacts with School	**-.21**	**-.18**	**-.19**	**-.17**	**-.13**	**-.12**
Post Secondary Contacts with School	.01+	.00+	.02	.00+	.03	.02+
Problems Communicating with School	.01+	.04	-.03	.01+	-.03	.00+
TYPE III: SUPPORT OF SCHOOL						
Support of School	**.12**	**.08**	**.10**	**.06**	**.09**	**.07**
TYPE IV: LEARNING ACTIVITIES						
College Encouragement	**.32**	**.22**	**.29**	**.22**	**.21**	**.16**
High School Graduation Encouragement	**-.17**	**-.07**	**-.16**	**-.06**	**-.13**	**-.09**
Private Educational Expenses	.07	.04	.01+	-.01+	.02+	.00+
Learn Post Secondary Opportunities	**.12**	**.08**	**.11**	**.09**	.05	.03
TYPE VI: COMMUNITY ACCESS						
Parent to Parent Communication	**.04**	**.04**	**.05**	**.04**	**.05**	**.04**
R^2	.22	.29	.19	.26	.11	.13

Note: The following twelfth grade variables are included as controls: Black, Asian, Latino, SES, Family Size, Two Parent Home, Parent Work Status in two- and one-parent homes, English as a second language, and a prior achievement indicator (see below)

a - Eighth grade standardized mathematics score is introduced as a prior achievement indicator together with the above controls

b - Eighth grade standardized science score is introduced as a prior achievement indicator together with the above controls

c - Eighth grade standardized reading score is introduced as a prior achievement indicator together with the above controls.

\+ Coefficients **not** significant at alpha <= .05. All others, significant at alpha <= .01

Table 1c: Influences of Twelfth Grade Parental Involvement on Enrollment in an Academic High School Curriculum (Standardized OLS Coefficients)		
Parental Involvement	**Academic Curriculum**	
	No Controls	**Controls** [a]
TYPE I: PARENT OBLIGATIONS		
Parent/Teen Communication	**-.05**	**-.04**
Parent/Teen Activities	-.02+	-.01+
Behavioral Supervision	.03	.00+
Knows Course Work	.01+	.00+
Academic Supervision	-.02+	-.01+
TYPE II: PARENT/SCHOOL COMMUNICATION		
School Initiated Academic Contacts	.03	.01+
Educational Contacts with School	**-.15**	**-.12**
Post Secondary Contacts with School	.03	.03
Problems Communicating with School	-.04	-.03
TYPE III: SUPPORT OF SCHOOL		
Support of School	**.10**	**.07**
TYPE IV: LEARNING ACTIVITIES		
College Encouragement	**.31**	**.22**
High School Graduation Encouragement	**-.14**	**-.05**
Private Educational Expenses	**.10**	**.04**
Learn Post Secondary Opportunities	**.11**	**.08**
TYPE VI: COMMUNITY ACCESS		
Parent to Parent Communication	.04	.03
R^2	.18	.24

[a] The following twelfth grade variables are included as controls: Black, Asian, Latino, SES, Family Size, Two Parent Home, Parent Work Status in two- and one-parent homes, English as a second language, overall GPA and an eighth grade standardized test score composite.

+ Coefficients **not** significant at alpha <= .05. All others, significant at alpha <= .01

The indicator of Type 6 involvement — parent to parent contacts — tends to have small positive effects on teens' course completions in all three subjects. It is possible that some parents obtain information from each other about curricular choices and their consequences for postsecondary opportunities. In this way, parents who are in contact with other parents in the community may be able to positively influence the number of credits their teens complete in core academic subjects.

Comparing the coefficients of all types of parental involvement on course completions in the three academic subjects reveals an interesting pattern. Unlike the diverse and somewhat isolated effects on test scores, selected parental involvement variables have a fairly consistent influence on course credits in all three academic subjects.

The effects of parental involvement on enrollment in an academic high school curriculum (Table 1c) are similar in strength and direction to those on completion of course credits. Parents' encouragement for college attendance has the strongest positive effect on enrollment in an academic high school curriculum. Even when variables related to social background, family configuration, and student achievement are controlled, encouragement for college attendance substantially increases seniors' probability of continued enrollment in an academic curriculum. Other noteworthy effects on curricular enrollment are those of parents' support of school, parents' efforts to learn about postsecondary opportunities, and private school expenses.

Indicators of parental involvement that are negatively associated with student test scores and completion of course credits are also negatively associated with enrollment in an academic high school curriculum. Thus, family practices of frequent educational contacts with school and parents' efforts to encourage their child's graduation from high school are negatively linked to student enrollment in an academic curriculum.

Effects of Eighth Grade Parental Involvement on Twelfth Grade Achievement

Previous research has established that parental involvement in the eighth grade has positive effects on eighth grade test scores. The analyses presented here (Table 2a) investigate whether parental involvement in the middle grades has long-term effects on test scores in the twelfth grade, after controlling for student background and eighth grade achievement. The results are again presented in two steps, with and without controls for race/ethnicity, socioeconomic status, family structure, parent work status, and student prior test score in each subject.

Table 2a: Influences of Eighth Grade Parental Involvement on Twelfth Grade Test Scores (Standardized OLS Coefficients)						
Parental Involvement	**Achievement Test Scores**					
	Mathematics		**Science**		**Reading**	
	No Controls	**Controls** [a]	**No Controls**	**Controls** [b]	**No Controls**	**Controls** [c]
TYPE I: PARENT OBLIGATIONS						
TV Viewing Supervision	-.07	.00+	-.06+	-.01+	-.05	-.02
Educational Expectations	**.36**	**.09**	**.29**	**.08**	**.30**	**.09**
Academic/Behavioral Supervision	**-.11**	**-.01**	**-.12**	**-.05**	**-.11**	**-.04**
TYPE II: PARENT/SCHOOL COMMUNICATION						
Educational Contacts with School	**-.15**	**-.04**	**-.10**	**-.02**	**-.14**	**-.03**
School Initiated Contact	.09	.01+	-.07	.00+	.04	.00+
TYPE III: SUPPORT OF SCHOOL						
Support of School	.09	.02	.09	.02	.09	.01
TYPE IV: LEARNING ACTIVITIES						
Academic Lessons	.06	.00+	.05	.00+	.07	.01+
Music/Dance Lessons	.11	-.02	.11	.00+	.15	.02
Parent/Teen Academic Communication	-.02	.00+	.00+	.00+	.02	.01+
TYPE V: DECISION MAKING						
PTO Participation	.07	.02	.02	-.02	.03	.00+
TYPE VI: COMMUNITY ACCESS						
Museum Visits	**.19**	**.04**	**.20**	**.07**	**.09**	**.07**
Participation in Community Groups	.11	.01	.13	.02	.10	.02
R^2	.24	.71	.18	.54	.19	.56

Note: The following eighth grade variables are included as controls: Black, Asian, Latino, SES, Family Size, Two Parent Home, Parent's Workstatus in two- and one-parent home, English as a second language and a control for prior Achievement (see below).

a - Eighth grade standardized mathematics score is introduced as a prior achievement indicator together with the above controls.
b - Eighth grade standardized science score is introduced as a prior achievement indicator together with the above controls.
c - Eighth grade standardized reading score is introduced as a prior achievement indicator together with the above controls.
+ Coefficients **not** significant at alpha <= .05. All others, significant at alpha <= .01.

Of all indicators of parental involvement, parents' educational expectations in grade eight show the strongest long-term effects on twelfth grade test scores in all subjects. Even though the magnitude of these coefficients substantially weakens with the introduction of controls on student background and prior achievement, they do not disappear. Therefore, early parental educational aspirations have some direct long-term effects on students' test performance during high school. This is the only eighth grade involvement indicator that has notable independent effects on twelfth grade test scores.

Parental supervision in the eighth grade of TV viewing and student academic/social behavior, as well as parental educational contacts with the middle school, are negatively associated with twelfth grade test scores. The effects tend to substantially weaken once control variables are introduced in the analyses. Because the eighth grade student survey includes a number of indicators of student behavior, it was possible to conduct further analyses to explore whether parents' contacts with school occur for students who exhibit problematic behavior (such as coming to school unprepared, coming to school with no books or pencils, cutting classes, coming late to school). These analyses, which are not presented here, show that the negative effects of educational contacts with school nearly disappear once student eighth grade behaviors are controlled. A similar finding is also reported by Sui-Chu and Willms (1996).

A number of other indicators have positive but very weak links with achievement test scores. These are activities that support school (Type 3 involvement); academic as well as music and dance lessons (Type 4 involvement); participation in PTOs (Type 5 involvement); museum visits and participation in community groups, such as scouts and sports teams (Type 6 involvement). Most of these effects, however, are indirect and disappear when family characteristics and eighth grade achievement are controlled. Interestingly, museum visits, which perhaps indicate family socioeconomic status, tend to have some lasting direct effects on twelfth grade achievement, particularly on science and reading test scores.

Effects of Eighth Grade Parental Involvement on Completion of Coursework and Curricular Enrollment

The long-term direct and indirect effects of eighth grade parental involvement on twelfth grade outcomes are stronger for completion of high school credits than for achievement test scores (Table 2b). This is especially true for parents' educational expectations, which have notable positive effects even when all control variables are introduced. The effect of this variable is strongest for the number of mathematics credits completed (standardized coefficient of .16).

Table 2b: Influences of Eighth Grade Parental Involvement on High School Credits Completed by the Twelfth Grade (Standardized OLS Coefficients)						
Parental Involvement	**Math**		**Science**		**English**	
	No Controls	**Controls [a]**	**No Controls**	**Controls [b]**	**No Controls**	**Controls [c]**
TYPE I: PARENT OBLIGATIONS						
TV Viewing Supervision	-.01+	.00+	.00+	.01+		.00+
Educational Expectations	**.31**	**.16**	**.26**	**.13**	**.20**	**.12**
Academic/Behavioral Supervision	-.05	-.01+	-.08	-.02	-.02+	.00+
TYPE II: PARENT/SCHOOL COMMUNICATION						
Educational Contacts with School	**-.14**	**-.11**	**-.13**	**-.11**	**-.07**	**-.06**
School Initiated Contact	.06	.01+	.09	.06	.01+	.00+
TYPE III: SUPPORT OF SCHOOL						
Support of School	.07	.03	.04	.00+	.04	.02
TYPE IV: LEARNING ACTIVITIES						
Academic Lessons	.03	-.01+	.05	.02	.01+	.00+
Music/Dance Lessons	.05	-.01+	.07	.01+	.06	.02+
Parent/Teen Academic Communication	**.05**	**.04**	**.06**	**.05**	**.07**	**.05**
TYPE V: DECISION MAKING						
P.T.O. Participation	**.11**	**.07**	**.07**	**.04**	**.07**	**.04**
TYPE VI: COMMUNITY ACCESS						
Museum Visits	.09	.01+	**.12**	**.04**	.07	.02
Participation in Community Groups	.03	-.02+	.06	.01+	.02	-.06
R^2	.15	.25	.12	.20	.06	.10

Note: The following eighth grade variables are included as controls: Black, Asian, Latino, SES, Family Size, Two Parent Home, Parent's Workstatus in two and one parent home, English as a second language and a control for prior Achievement (see below).

Achievement Controls:
a - Eighth grade standardized mathematics score is introduced as a prior achievement indicator together with the above controls.
b - Eighth grade standardized science score is introduced as a prior achievement indicator together with the above controls.
c - Eighth grade standardized reading score is introduced as a prior achievement indicator together with the above controls.

+ Coefficients **not** significant at alpha = .05. All others significant at alpha = .01.

Table 2c: Influences of Eighth Grade Parental Involvement on Enrollment in an Academic High School Curriculum (Standardized OLS Coefficients)		
Parental Involvement	**Academic Curriculum**	
	No Controls	**Controls[a]**
Type I: Parent Obligations		
TV Viewing Supervision	-.02	-.01+
Educational Expectations	**.26**	**.14**
Academic/Behavioral Supervision	-.04	.00+
Type II: Parent/School Communication		
Educational Contacts with School	**-.10**	**-.06**
School Initiated Contact	.08	.04.
Type III: Support of School		
Support of School	**.10**	**06**
Type IV: Learning Activities		
Academic Lessons	.06	.02
Music/Dance Lessons	.05	.00+
Parent/Teen Academic Communication	.06	.04
Type V: Decision Making		
P.T.O. Participation	**.10**	**.07**
Type VI: Community Access		
Museum Visits	.09	.03
Participation in Community Groups	.06	.02
R^2	.12	.19

a The following eighth grade variables are included as controls: Black, Asian, Latino, SES Family Size, Two Parent Home, Two Income Family, Parent Work Status in one- and two-parent homes, English as a Second Language and Eighth Grade Standardized Test Score Composite.

+ Coefficients **not** significant at alpha <= .05. All others significant at alpha <= .01

Other types of eighth grade parental involvement also have stronger effects on twelfth grade coursework completed than on twelfth grade test scores. Specifically, parent educational contacts with school is negatively linked to number of course credits completed. Additional controls of students' behavioral characteristics (not shown here) entirely explain the negative coefficient for English credits and reduce the magnitude of the effects on mathematics and science credits to about one-half of their original values.

Communication between parents and students regarding academic matters in the middle grades (indicator of Type 4 involvement) tends to have a positive effect on the course credits that students complete in high school. Participation in school decision making (Type 5 involvement) as well as museum visits (Type 6 involvement) also have some positive effects on high school credits completed. Museum visits during the eighth grade maintain a small direct effect on the number of science credits completed in high school.

The effects of parental involvement in the middle grades on enrollment in an academic curriculum during high school are similar to the effects on course credits completed (Table 2c). Again, educational expectations in grade eight show the strongest positive effect on the probability of enrollment in an academic curriculum. This effect remains sizable when family and student characteristics in the eighth grade are controlled. The indicators of Type 3 and Type 5 involvement, supporting school by volunteering and fund raising and participating in PTO's, positively affect the probability of enrollment in an academic curriculum in high school. Although not very strong, these effects indicate that parents who are active in school may gain information that helps them influence the future curricular placements of their children.

Summary and Conclusions

Numerous research findings support the existence of a positive relationship between parental involvement and educational success. However, most existing research investigates parental involvement in the elementary grades, leaving family involvement in secondary education relatively unexplored. Current knowledge regarding the influence of family involvement in secondary education is inconsistent and rather limited in scope (Singh, Bickley, et al., 1995). For example, researchers report both positive and negative effects on achievement for practices such as parent/student communications and parental monitoring of students' behavior. Research on parental involvement during high school has mostly focused on test scores, leaving possible effects on other educational outcomes relatively

unexplored. Finally, the degree to which family practices may have sustained, long-term effects on educational outcomes years later is not known.

The present study seeks to clarify and expand existing knowledge of parental involvement in secondary education, specifically in high school, and to resolve some of the inconsistencies reported in the literature. The *National Educational Longitudinal Study* of 1988 (NELS:88) is particularly suited for this type of investigation, not only because it is nationally representative and longitudinal in scope, but also because it includes surveys from both students and their parents. This study uses data from a subsample of the NELS:88 base year and follow-up surveys consisting of all parents whose students remained in school till the senior year in high school. The study uses twelve indicators of family practices in the eighth grade and fifteen indicators in the twelfth grade. These indicators are drawn from the parent surveys and represent the general typology of parental involvement identified by Epstein (1992): (1) parents' basic obligations for establishing a positive home environment, (2) parent-school communications about school programs and student progress, (3) parent participation and volunteering at school, (4) parent efforts to enhance learning activities at home, (5) parent involvement in school decision making, and (6) parent-community contacts that increase students' learning opportunities.

Data analyses investigate whether parental involvement influences a number of twelfth grade educational outcomes: achievement test scores in mathematics, science, and reading; number of credits completed in mathematics, science, and English; and curricular enrollment. The results reveal that in order to fully investigate parental involvement in secondary education, researchers cannot ignore its multidimensional nature. Use of a consistent analytic strategy and a multitude of involvement indicators clarifies a number of inconsistent results previously reported in the research literature. Inconsistent findings regarding parental involvement in secondary education are mostly due to the different indicators of parental involvement that each researcher has used and to differences in the educational outcomes under investigation. The findings of this study show that within the six types of parental involvement identified by Epstein (1992), only some indicators significantly affect educational outcomes in high school, and the effects may be positive *or* negative. The effects of these indicators of parental involvement are stronger for educational outcomes and behaviors such as course work completed and curriculum enrollment than for achievement test scores. These findings parallel findings based on analyses of tenth grade student data showing that family practices affect students' behaviors and attitudes more than their achievement test scores (Lee, 1994).

Investigations of the effects of twelfth grade parental involvement on high school seniors' achievements lead to the following general conclusions. Parental involvement does influence educational outcomes in the twelfth grade, but its effects are weaker than those reported for earlier grades. Parents' educational expectations and encouragements are by far the most important type of family practice that affects all measures of senior achievement. In the twelfth grade, parents who encourage their children to attend college positively influence their teen's academic achievements. This is especially clear for the number of course credits in core academic subjects that seniors complete, and for enrollment in an academic high school curriculum. The positive effects of parental educational aspirations and encouragement are reported by a number of researchers using a variety of indicators and data sources (Astone & McLanahan, 1991; Fehrman et al., 1987; Sui-Chu & Willms, 1996; Milne et al., 1986; Muller, 1993).

While encouragement for postsecondary attendance has the strongest positive effects, other family practices that support and enhance learning opportunities at home (Type 4 parental involvement) have consistent positive effects on senior achievements as well. By contrast, indicators of Type 1 involvement (parenting) have only small effects on seniors' academic achievements. It seems that establishing a positive home environment by supervising children's academic and social behavior may not be as important at this stage of schooling as in earlier years. Perhaps, at this age, teens have acquired a certain degree of independence and are relatively self-directed. The only notable exception to the lack of strong positive effects of Type 1 involvement is parents' knowledge of teen's course work. This variable has a positive influence on the number of credits students completed, especially in English.

Indicators of other types of family involvement, such as participating in activities that support school and contacting other parents, have some positive influences on senior achievements, especially on course credits completed. Positive effects of volunteering, other support of the school, and participation in PTOs are also reported for both middle school and high school achievement test scores by Sui-Chu and Willms (1996), Stevenson and Baker (1987), and Lee (1994).

Overall, the present research findings indicate that during high school, the most effective types of parental involvement are not those geared towards behavioral supervision, but rather, those geared towards advising or guiding teens' academic decisions. Therefore, parents who stay well informed about important academic issues could still be helpful to high school students who may be making their own decisions about school.

Some of the negative effects of parental involvement that have been reported in the literature are also observed in the NELS:88 data. Indicators of Type 1 parental involvement that refer to parents' behavioral and academic supervision of their teens, as well as frequent academic contacts with school, are negatively linked with students' academic achievement. The reasons for such negative influences remain unexplained by the present analyses. It may be necessary to use more refined measures of student behavior than the ones used here in order to explain why frequent parent/student communication and activities show negative effects on senior achievement. Rather than lowering students' level of achievement, these family practices probably represent parents' attempts to deal with already existing academic or behavioral problems. The present results are consistent with those of Milne et al., (1986), Muller (1993), and Sui-Chu and Willms (1996), and support the conclusion that these types of family practices represent parents' attempts to cope with children's problematic behavior. It seems that when parents are faced with behavioral problems, they increase the supervision of their teens. They also seek the help of school personnel by increasing their contacts with the school.

As expected, eighth grade parental involvement has weaker effects on senior achievements than concurrent twelfth grade involvement, but some family practices do have long-term effects, influencing academic achievement in later grades. This study shows that the educational expectations of parents in the eighth grade have direct effects on twelfth graders' test scores, course credits completed, and enrollment in academic curricula. Other family practices, such as frequent communication with eighth graders regarding educational matters and frequent museum visits, also have positive long-term effects on one or more of these outcomes. Parent-school contacts and support of school in the middle grades have some small lasting positive effects on seniors' course work and curricular enrollments as well. Although the effects of eighth grade parent-school contacts on twelfth grade outcomes are weak, they exist in addition to any indirect effects through their influence on eighth grade achievement. The data suggest that sustained family-school support, such as parent volunteering at school, increases parents' ability to influence their children's education during high school.

Some eighth grade parental involvement is negatively linked over the long term to seniors' academic achievements. Most of these long-term negative effects of parental involvement may be explained by detailed information regarding students' problematic behavior.

Some clear patterns emerge from the analyses of the eighth and twelfth grade parental involvement. The NELS:88 follow-up surveys indicate that most parents in the U.S. attempt to influence their teens' educational achievements through the last year of high school. While some of their family practices are geared to monitor and correct problematic behaviors, other practices are associated with positive educational outcomes. High educational expectations, consistent encouragement and actions that enhance learning opportunities of students and, to a lesser extent, support by the school and other parents are the major ways through which families continually and positively influence the educational achievements of their teens. Families with high levels of involvement in such practices, whether measured in the middle grades or in high school, have the most positive effects on various indicators of senior achievements. The positive effects are reduced but continue to exist after controlling for students' social background, family configuration and educational characteristics. The results confirm that maintaining high levels of parental involvement in students' education from the middle grades to the last year of high school does "make a difference." School efforts to encourage sustained parental involvement through the twelfth grade may therefore be a fruitful avenue for improving students' educational success.

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Appendix A: Base Year Parental Involvement Orthogonal Factor Analysis			
	Variable Name	**Factor Pattern**	**Variable Description**
Type 1: Parent Obligations			
TV Viewing Supervision			*Family Rules For:*
	BYP64D	.79	School Day Television
	BYP64C	.76	Television Hours
	BYP64B	.61	Television Time
	BYP64A	.61	Television Programs
Educational Expectations			Expectations:
	BYP83	.77	Additional Education
	BYP76	.76	Attainment Level
Academic Behavioral Supervision			*Family rules for*
	BYP65B	.63	Doing homework
	BYP65C	.55	Household Chores
	BYP65A	.52	Maintaining Average
Type 2: Communications			
Educational Contacts with School			*Parent Contacts About*
	BYP58C		Behavior
	BYP58A	.79	Academic Performance
	BYP58B	.63	Academic Program
		.55	
School Initiated Academic Contacts			*School Contacts About*
	BYP57E	.70	Behavior
			School Contacts About
	BYP57C	.81	H.S. Course Selection
	BYP57D	.80	H.S. Program Placement
	BYP57B	.60	Academic Program
Type 3: Support of School			
Support of School			*Parent Contacts About*
	BYP58D	.62	Fund Raising
	BYP58E	.59	School records
	BYP58F	.57	Volunteer Work
			School Contacts About
	BYP57F	.59	Fund Raising
	BYP57G	.59	School Records
	BYP57H	.59	Volunteer Work

Appendix A Continued			
	Variable Name	**Factor Pattern**	**Variable Description**
Type 4: Learning Activities			*Outside Regular School:*
Academic Lessons	BYP60F	.59	History Study
	BYP60D	.56	Language Study
	BYP60G	.56	Computer Study
	BYP60A	.48	Art Study
Music/Dance Lessons			*Outside Regular School:*
	BYP60B	.45	Music Study
	BYP60C	.42	Dance Study
Parent/Teen Academic Communication			*Parent Speaks About:*
	BYP67	.83	H.S. Plans
	BYP68	.79	Post H.S. Plans
	BYP66	.63	School Experiences
Type 5: Decision Making			*Parent Teacher Organization*
Parent Teacher Organization Participation	BYP59B	.72	Attend
	BYP59C	.72	Participate
	BYP59A	.70	Belong
Type 6: Community Access			*Child Visits:*
Museum Visits	BYP61EB	.82	History Museum
	BYP61DB	.80	Science Museum
	BYP61CB	.76	Art Museum
Participation in Community Groups			*Child's Involvement:*
	BYP63A	.80	Boy/Girl Scouts
	BYP63B	.80	Cub Scouts/Brownies
	BYP63G	.44	Sports Teams

Appendix B: Second Follow-Up Parental Involvement Orthogonal Factor Analysis			
	Variable Name	**Factor Pattern**	**Variable Description**
Type 1: Parent Obligations			*Discuss with Teens About*
Parent Teen Communication	F2P49J	.66	Interests and Hobbies
	F2P49I	.64	Troubling Issues
	F2P49C	.63	Studies
	F2P49B	.54	School Activities
	F2P49H	.53	Community, National or World Events
	F2P49D	.53	Teen's Grades
	F2P49A	.51	Course Selection
	F2P49G	.49	Teen's Job Application
Parent Teen Activities			*Parent and Teen Go*
	F2P50J	.70	To Restaurants
	F2P50I	.66	Shopping
	F2P50L	.63	Do Fun Things
	F2P50G	.63	One Day Trips and Vacations
	F2P50F	.53	To Family Social Functions
	F2P50C	.46	To Concerts, Plays and Movies
Behavioral Supervision			*Who Decides Teen's*
	F2P48E	.76	Home Alcohol Comsumption
	F2P48G	.71	Privileges
	F2P48A	.63	Late Hours
	F2P48F	.58	Overall Alcohol Consumption
	F2P48B	.53	Car Privileges
Knowledge of Coursework			*Parent Knows Teen's*
	F2P46C	.86	Number of Credits Earned
	F2P46D	.86	Number of Credits Needed
	F2P46A	.56	Current Courses
	F2P46B	.46	Current Academic Performance

Appendix B continued			
	Variable Name	**Factor Pattern**	**Variable Description**
Academic Supervision			*Who Decides Teen's*
	F2P48H	.76	College Attendance
	F2P48I	.75	Course Selection
	F2P48D	.64	Spending of Money
	F2P48C	.57	Work Status During School
Private Education Expenses			*Educational Expenses for:*
	F2P76A	.72	Private School
	F2P76B	.58	Tutoring
Type 2: Communications			*Parent Contacts About*
Postsecondary Contacts with School	F2P44D	.77	College Prep Course Selection
School Initiated Academic Contacts			*School Contacts About*
	F2P43B	.72	Academic Program
	F2P43C	.69	Teen's Plans After H.S.
	F2P43D	.66	College Prep Course Selection
	F2P43H	.56	How to Help Teen with Work
	F2P43A	.55	Academic Performance
Problematic Communication with School			*Parent's Problems*
	F2P26D	.95	Being Understood by Teachers
	F2P26C	.95	Understanding Teachers
Educational Contacts with School			*Parent Contacts About*
	F2P44E	.74	Attendance
	F2P44F	.70	Behavior
			School Contacts About
	F2P43E	.69	Attendance
	F2P43F	.67	Behavior

Appendix B continued			
	Variable Name	**Factor Pattern**	**Variable Description**
Type 3: Support of School			*Parent Contacts About*
Support of School	F2P44G	.60	Volunteer Work
			School Contacts About
	F2P43G	.55	Volunteer Work
			Parent Attend with Teen
	F2P50A	.66	School Activities
	F2P50D	.62	Sports Outside School
			Parent Activities with Teen
	F2P50H	.50	Hobby or Sports
Type 4: Learning Activities			*Attends Programs About*
Learn about	F2P45B	.78	College Financial Aid
Postsecondary Opportunities	F2P45A	.76	Education After High School
	F2P45C	.74	Employment Opportunities
Encouragement for High School			*Parent Encourages Teen to*
Graduation	F2P62C	.70	Prepare for ASVAB
	F2P62D	.61	Prepare for GED
College Encouragement			*Expectations:*
	F2P61	.66	Attainment Level
			Parent Encourages Teen To
	F2P62A	.59	Prepare for SAT
			Talks with Teens About
	F2P63	.59	Applying for College
			Discuss with Teen About
	F2P49F	.67	Applying to Colleges
	F2P49E	.59	Planning for SAT/ACT
Type 6: Community Access			*Discuss with Other Parents*
Parent to Parent Communication	F2P56B	.91	Teen's Education Plans
	F2P56C	.90	Teen's Career Plans
	F2P56A	.76	Things at Teen's School

Appendix C: Descriptive Statistics of Dependent Variables					
Variable	**N**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**
Mathematics Standardized Score	10,064	51.99	9.23	29.50	71.37
Science Standardized Score	10,000	51.86	9.32	30.11	70.81
Reading Standardized Score	10,056	51.72	9.19	29.15	68.09
Credits in English	10,814	3.99	0.92	0	10.00
Credits in Mathematics	10,814	3.16	0.99	0	8.33
Credits in Science	10,814	2.91	1.03	0	10.00
Academic Curriculum	11,512	0.48	0.49	0	1.00

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